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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/586,114

08/24/2007

Geoff C. Gerhardt

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Waters Technologies Corporation
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EXAMINER

PREGLER, SHARON

ART UNIT

PAPER NUMBER

1772

MAIL DATE

DELIVERY MODE

03/17/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/586,114	GERHARDT ET AL.	
	Examiner	Art Unit	
	Sharon Pregler	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The Examiner acknowledges amendment filed on December 15, containing remarks to the claims.

Claims 1-61 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3-9, 11-19, 22-23, 28-30, 33-44, & 46-60, are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibamoto US Patent 5,672,810 in view of Gilson et al. US Patent 3,624,263.

Regarding claims 1 & 44 Shibamoto teaches in Figure 1 a chromatograph comprising a main body 23 with a chamber within (claimed housing with chamber), a sample injection port 11 (claimed first inlet opening) which receives a needle (first inlet conduit means) with a sample injected (sample supply) into the chamber of the main body (*column 3 lines 60-63*), an exit column 12 (first exit conduit means) within an opening, or unshaded portion depicted in figure 1 at the bottom of body 23 (first exit

opening), for transporting fluid out (*column 4 lines 8-20*), a split flow line 28 (second exit opening) for discharging, and carrier gas line 26 (second inlet opening) for receiving fluid, and control unit 14 that controls the flow rate control valves 32 & 34, which are respectively in the carrier flow line 26 (second inlet opening) and split flow line 28, (second exit opening).

Shibamoto does not explicitly teach that the second exit and inlet opening respectively receives a second exit conduit and second inlet conduit, or a waste receptacle connected to the second exit means.

However in the analogous art of chromatography columns, Gilson teaches in Figures 1-2 a chamber 12 where multiple inlets and outlets are received by conduits: inlet liquid supply conduit 24 (inlet conduit means) received by inlet 22 (inlet opening), and liquid delivery conduit 16 (outlet conduit means) received by outlet 28 (outlet opening) (*Gilson column 2 lines 5-30*), vent conduit 60 (outlet conduit means) received by vent opening 56 (outlet opening), pressurized air conduit 58 (inlet conduit means) received by air opening 54 (inlet opening) (*column 3 lines 25-45*). Conduits may be any size and length to provide means for supplying the chamber with sample and to provide means for delivering sample from the chamber which would benefit from liquid transport without relying on gravity or siphon effects (*Gilson column 2 lines 70-75*).

Therefore it would be obvious to use conduit means in the second inlet and outlet openings of Shibamoto and to provide means for delivering sample from the chamber which would benefit from liquid transport without relying on gravity or siphon effects. It would have been obvious to one of ordinary skill in the art to put a waste receptacle at the end of an exit to capture ejected fluids.

Although Shibamoto teaches the apparatus for gas chromatography, gas is still classified as a fluid (impelling of fluids = gas or liquid). Furthermore, claim 1 is limited only to its structure not process.

Regarding claims, 3-4, 13, these claims are regarded as intended use and do not add weight to the apparatus claims. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the

prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Regarding claim 5, Shibamoto does not teach the first exit conduit valve means interposed in said first exit conduit means.

However Gilson teaches valve 30 disposed on the liquid delivery conduit 16 (outlet conduit means), figure 1.

It would have been obvious to incorporate valves on conduit means to control the flow of fluid (*Gilson column 3 lines 20-25*).

Regarding claims 6, 7, 8, & 56 Shibamoto in view of Gilson teaches the first exit conduit means is a capillary having a first end in said first exit opening (*column 12 outlet fits through an opening in chamber 23*), a mid portion external to said housing (*portion extends from the chamber 23*), and a second end formed as a liquid chromatography column having an input end and an output end (*column 12 in figure 1*), wherein said first exit conduit valve means is disposed in said mid portion (*Gilson valve above*) (regarding claim 6) and first end of said capillary extends into said chamber (regarding claim 7) (*tip of 12 extends within chamber 23*) is positioned between said second inlet opening and said second exit opening (regarding claim 8) (*tip of 12 is slightly above outlet 28 and below inlet 26*).

Regarding claims 9, 36, & 43 Shibamoto teaches the device above but does not explicitly teach wherein said capillary has an inner diameter between approximately 15 μm and 150 μm (regarding claim 9) or said vent conduit means has an inner diameter between approximately 25 μm and 150 μm (regarding claim 36) and wherein said second inlet and second exit openings accommodate a conduit means having an inner diameter between approximately 15 μm and 50 μm (regarding claim 42).

However it would have been obvious to one having ordinary skill in the art to use these dimensions for conduit means. Scaling up or down of an element which requires a change in size is generally considered as being within ordinary skill in the art as evidenced by Gilson column 2 lines 65-75. One would have been motivated to use the dimensions above to allow a desired amount of flow through the conduits for moving the liquid sample.

Regarding claim 11, Shibamoto teaches the device of claim 1 further comprising a first supply device (*supply through needle column 3 lines 60-65*) connected to said first inlet conduit means, said first supply device having a supply state wherein said first fluid is supplied at a pressure up to a maximum pressure and a stop state wherein said first fluid is not supplied, said first supply device responsive to a supply signal to assume one of said states (*column 3 lines 1-25*).

Regarding claim 12, Shibamoto teaches the device of claim 11 further comprising a control means (*gas control unit 14*) for controlling each of said at least one valve means by sending a signal to said valve means to assume one of said open and closed positions (*column 3 lines 25-30*).

Regarding claim 16, 51 & 53, Shibamoto teaches the device of claim 13 further comprising a fluid monitor (*system control 16*) for monitoring a fluid passing through said second exit conduit means for providing said control means with information about the composition of the fluid exiting said chamber.

Regarding claim 19, Shibamoto teaches the device of claim 13 wherein said control means (*gas control unit 14*) sends a supply signal to said first supply device to effect a supply state of said first supply device and sends one or more signals to said at least one valve means to effect a closed position of said second inlet valve means and said second exit valve means and an open position of said first exit valve means for impelling a pressurized fluid through said first exit conduit means.

Regarding claim 28, 29, & 30 Shibamoto in view of Gilson teaches a second exit conduit valve means (*valve 62*) interposed in said second exit conduit means, comprising a second inlet conduit valve means interposed in said second inlet conduit means, a second fluid source connected to said second inlet conduit valve for supplying said second fluid. (*Gilson Figure 1, column 3 lines 25-35*).

Regarding claim 33, Shibamoto teaches the device of claim 31 further comprising:

a vent opening (*purge flow line 27, column 3 line 26*) in said housing extending from said chamber to said exterior surface for receiving a vent conduit means;

and a vent conduit means (*channel in figure 1*) received by said vent opening in communication with said chamber for transporting fluids from said chamber out of said vent opening, said vent conduit means for connection with a vent conduit valve means (*column 3 lines 18-26*).

Regarding claim 34, Shibamoto teaches the device of claim 33 further comprising a vent conduit valve means interposed in said vent conduit means having an open position wherein fluid is allowed to flow through said vent conduit valve means and a closed position wherein fluid is prevented from flowing through said vent conduit valve means, and wherein said vent conduit valve means is responsive to a signal to assume one of said positions (*figure 1*).

Regarding claim 35, Shibamoto teaches the device of claim 34 wherein said control means sends a supply signal to said first supply device to effect a stop state of said first supply device and sends one or more signals to said at least one valve means to effect a closed position of said first exit valve means and said second inlet conduit valve means and an open position for said second exit conduit valve means and said vent conduit valve means for discharging fluid from said chamber (*figure 1*).

Regarding claims 37 & 38, Shibamoto teaches the first inlet opening is positioned in one of the walls (*top wall, figure 1*) selected from said first and second end walls and said first exit opening is positioned in the other wall selected from said first and second end walls (*bottom of the chamber*) second inlet opening is positioned through said cylindrical wall proximate (*sides of chamber*) said first exit opening and said second exit opening is positioned through said (cylindrical) wall proximate said first inlet opening (*figure 1*).

Shibamoto in view of Gilson do not explicitly teach a cylindrical chamber wall. However, it is well known in the art of fluidics to use a round shaped wall to prevent unnecessary fluid turbulence.

Regarding claim 40, Shibamoto teaches the vent (*purge flow line 27, column 3 line 26*) opening is positioned through said cylindrical wall approximately diametrically opposite said second input opening (*Figure 1*).

Regarding claim 41 & 42, Shibamoto teaches the device of above but does not explicitly teach the housing comprises an inert material is stainless steel or titanium. However these materials are well known in the art of chromatography apparatuses for its durability and chemical inertness.

Regarding claim 14, 15, 17-19, 46, 47, 49, 50, 52, 58-60 Shibamoto teaches the carrier gas line 26 (second inlet) includes a flow rate sensor (F) 31 and a flow rate control valve 32, the purge flow line 27 includes a pressure sensor (P) 33, and the split flow line 28 (second exit) contains a flow rate control valve 34. They are all connected to the gas control unit 14. A temperature sensor 35 for detecting the temperature of the column 12 is also connected to the gas control unit 14. On the basis of the detected temperature T1 of the column 12, the detected inlet pressure P at the column 12 (as measured by the pressure sensor 33), and the detected flow rate R of the carrier gas, the gas control unit 14 controls the flow rate control valves 32 and 34 respectively in the carrier gas flow line 26 and the split flow line 28 such that a desired split ratio is obtained (column 3 lines 25-35).

The gas control unit 14 and the temperature control unit 15 are connected to the system control unit 16. The system control unit 16 serves to output control signals to the gas control and temperature control units 14, 15 to carry out vaporization of the liquid sample as will be described below in detail. Detection signals from the detector 13 are also transmitted to the system control unit 16 and analyzed thereby (column 3 lines 48-57).

Claims 2 & 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibamoto US Patent 5,672,810 in view of Gilson et al. US Patent 3,624,263 as evidenced by Bevan Analytical Chem. 1995, 67, 1470-1473.

Regarding claims 2 & 61, Shibamoto teaches the device of claim 1 but does not teach at least one valve means is a freeze-thaw valve. However, the use of freeze thaw valves is well known in the art for fluid control in capillaries as evidenced by Bevan et al. which manages flow in capillaries or narrow channels by freezing and thawing the

contents of a small section of the tube to not use any moving parts and contribute to no effective void volume.

Claims 10, 20, 21, 24-27, 31-32, 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibamoto US Patent 5,672,810 in view of Gilson et al. US Patent 3,624,263 as applied above and in further view of Oberhauser US 6,190,550.

Regarding claims 10, 21, 20, 24-27, 31-32, 45, Shibamoto in view of Gilson does not teach the pressure ranges for high pressure chromatography.

However, Oberhauser teaches in figure 1 a liquid chromatography apparatus with an elongated column with pump means 26 and 36, injectors 22 and 32 to input conduit 25 coupled to column 20 under the control of controller 39 (*column 4 lines 25-65*) where materials for the conduits are chosen to withstand pressures of up to several thousand psi. When portions of the conduits are placed in apertures, a tight fitting such as screws or O-rings are necessary to hold the conduits in place and prevent fluid leakage (*column 6 lines 25-50*).

Thus it would have been obvious to choose the fitting means and materials of Oberhauser to with the arrangement of Shibamoto and Gilson's column and conduit arrangement to perform high pressure liquid chromatography.

Response to Arguments

Applicant's arguments with respect to claims 1-61 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharon Pregler whose telephone number is (571)270-5051. The examiner can normally be reached on Mon - Fri 8am-4pm.

Art Unit: 1772

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, In Suk Bullock can be reached on (571)272-5954. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sharon Pregler/
Examiner, Art Unit 1772

/In Suk Bullock/
Supervisory Patent Examiner, Art Unit 1772